



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,490	01/28/2004	Motomi Matsunaga	1232-5261	5062
27123	7590	09/19/2006	EXAMINER	
MORGAN & FINNEGAN, L.L.P. 3 WORLD FINANCIAL CENTER NEW YORK, NY 10281-2101			PRITCHETT, JOSHUA L	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/767,490

Applicant(s)

MATSUNAGA ET AL.

Examiner

Joshua L. Pritchett

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

This action is in response to Request for Continued Examination and Amendment filed August 9, 2006. Claim 1 has been amended as requested by the applicant.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4-6 and 13-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi (US 2003/0107816) in view of Takeyama (US 2002/0039232).

Regarding claims 1, 5, 6, 13, 14, 16 and 17 Takagi teaches an optical system comprising a plurality of optical surfaces (31a-c) including a first surface (31b) on which light rays from an object (10) are reflected (Fig. 2), and a second surface (31c) reflecting the light rays reflected by the first surface back toward the first surface (Fig. 2); wherein the first surface reflects a central field angle principal ray, which comes from the second surface and is again incident on the first surface, to the opposite side of the previous reflection with respect to a normal at a hit point of the central field-angle principal ray on the first surface (Fig. 2). Takagi lacks reference to the use of a diffractive surface. Takeyama teaches the plurality of optical surfaces includes a diffractive

Art Unit: 2872

optical surface (3; Fig. 1). Takeyama teaches the diffractive optical surface is one of the plurality of optical surfaces other than the first and the second surface (Fig. 1). Takeyama teaches the first and the second surfaces are formed on a first transparent member filled with an optical medium (Fig. 1) and wherein the diffractive optical surface, which is not the first or second surface, is formed on a second transparent member filled with an optical medium (Fig. 1). Fig. 1 shows that diffractive element (3) has depth and that the reflection and diffraction occurs at the back surface of the medium. Takeyama teaches the diffractive optical surface has a reflection action (para. 0127; Fig. 1). Takeyama teaches the diffractive optical surface has a transmissive action (para. 0127; Fig. 1). Takeyama teaches the diffractive optical surface is arranged between the object and the intermediate image (Fig. 1). Takeyama teaches the diffractive optical surface is provided at a position, which is closer to a pupil image-forming position of the light rays from the object than to the object (Fig. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Takagi invention include the diffractive surface of Takeyama prior to the light ray entering the optical body (31 of Takagi) for the purpose of allow only light with certain wavelengths to enter the eye of the observer to prevent damage to the eye.

Regarding claim 2, Takagi teaches the first surface is decentered with respect to the light rays from the object (Fig. 2).

Regarding claim 4, Takagi teaches the first surface and the second surface are formed on a transparent member filled with an optical medium (Fig. 2).

Regarding claim 15, Takagi teaches the light rays from the object form an intermediate image inside the optical system (para. 0075).

Regarding claims 18 and 22, Takagi teaches the use of an optical system with a first (31b), second (31c) and third (31a) surface. Takagi further teaches the light transmitting through the third surface, reflecting off the first surface, reflecting off the second surface, reflecting off the first surface, reflecting off the third surface and transmitting through the first surface (Fig. 2). In another embodiment Takagi teaches a first (D), second (C) and third (B) surface and the light transmitting through the third surface, reflecting off the first surface, reflecting off the second surface, reflecting off the first surface, reflecting off the second surface, reflecting off the first surface, reflecting off the third surface and transmitting through the first surface (Fig. 16).

Regarding claims 19, 21, 23 and 25, Takagi further teaches the angle formed on reflection at the second surface being less than 60-degrees (para. 0089).

Regarding claims 20 and 24, Takagi teaches a first (31b), second (32c) and third (31a) surface and transmission through the first and third surfaces and reflection at the first, second and third surfaces (Fig. 2). The claims do not require that the events listed in the claim limitations happen in any certain order. The prior art teaches that the claimed events occur and therefore meet the claim limitations.

Regarding claim 26, Takagi teaches an image-forming device (10) forming an original image and an optical system guiding light from the original image to a viewer's eye or to a projection surface (Fig. 2).

Claims 3 and 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi (US 2003/0107816) in view of Takeyama (US 2002/0039232) as applied to claim 1 above further in view of Yamazaki (US 6,687,057).

Regarding claim 3, Takagi in combination with Takeyama teaches the invention as claimed but lacks reference to the diffractive surface being the second surface. Yamazaki teaches the diffractive surface being the second surface in a prism (col. 5 lines 24-29). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Takagi in combination with Takeyama invention include the diffractive surface on the second surface as taught by Yamazaki for the purpose of reducing the number of optical elements present in the optical path.

Regarding claims 7-12, Takagi in combination with Takeyama teaches the invention as claimed but lacks reference to the symmetry of the diffractive surface. Yamazaki teaches the use of both rotationally symmetric (col. 10 lines 10-12) and asymmetric (col. 7 lines 50-51) diffractive surface. Yamazaki further teaches the use of both symmetric and asymmetric phase distribution (abstract). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Takagi in combination with Takeyama diffractive surface to have the symmetry of Yamazaki for the purpose of minimizing aberrations during diffraction.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi (US 2003/0107816) in view of Takeyama (US 2002/0039232) as applied to claim 1 above further in view of Sekita (US 5,917,662).

Takagi in combination with Takeyama teaches the invention as claimed but lacks reference to a photoelectric conversion device. Sekita teaches the use of a photoelectric conversion device (col. 7 lines 34-36) in an optical system forming an object image on a light-

receiving surface of the photoelectric conversion device (Fig. 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Takagi in combination with Takeyama optical device used in a photoelectrical conversion device as taught by Sekita for the purpose of recording an object image.

### ***Response to Arguments***

Applicant's arguments, see Amendment, filed August 9, 2006, with respect to the rejection(s) of claim(s) 1 under Takeyama have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Takagi in view of Takeyama. Applicant amended the claim language to overcome the Takeyama reference. The Takagi reference teaches the claimed reflection pattern claimed by the claim language.

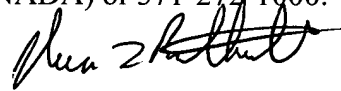
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L. Pritchett whose telephone number is 571-272-2318. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2872

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Joshua L Pritchett  
Examiner  
Art Unit 2872